

Claims

- [1] A direct drive motor in a washing machine comprising:
a stator 14 having a winding portion with coils wound thereon;
a rotor 13 fixedly connected to a washing shaft 4 for direct drive of a drum, the rotor 13 having a sidewall 13b, and a rear wall 13a with a pass through hole 131 at a center; and
a connector 16 of a material having a vibration mode different from the washing shaft, insert molded at the center of the rear wall 13a of the rotor to form one body with the rotor, and fixedly connected to the washing shaft to connect the rotor to the washing shaft, and support the washing shaft.
- [2] The direct drive motor as claimed in claim 1, wherein the rotor 13 is constructed of steel plate by pressing to form the side wall 13b and the rear wall 13a as one body.
- [3] The direct drive motor as claimed in claim 2, wherein the pass through hole 131 at a center of the rear wall 13a of the rotor 13 is formed at a center of a hub 132 which is a portion projected in a stator side or in a direction opposite thereto with respect to neighboring surface.
- [4] The direct drive motor as claimed in claim 3, wherein the washing shaft 4 is formed of metal, and the connector 16 is formed of resin which insulates between the washing shaft 4 and the rotor 4
- [5] The direct drive motor as claimed in claim 4, wherein the connector 16 includes a serration 164 on an inside circumferential surface having a shape in conformity with a shape of a serration 400 at a rear end portion of the washing shaft 4.
- [6] The direct drive motor as claimed in claim 5, wherein the connector 16 further includes reinforcing ribs 161 for reinforcing strength of the connector 16
- [7] The direct drive motor as claimed in claim 4, wherein the rotor 13 includes at least one communication hole in a neighborhood of the pass through hole 131 for enhancing bonding force between the connector 16 of resin and the rotor at the time of insert molding of the connector.
- [8] The direct drive motor as claimed in claim 7, wherein the connector 16 is insert molded in the rotor such that the connector 16 covers an inside of the pass through hole 131 and front and rear surfaces of neighborhood of the pass through hole 131 of the rotor.
- [9] The direct drive motor as claimed in claim 7, wherein the pass through hole 131

in the rotor 13 has a bonding piece 210 projected in a length direction of the washing shaft 4 for enhancing bonding force between the connector 16 of resin and the rotor 13 at the time of insert molding of the connector.

- [10] The direct drive motor as claimed in claim 4, wherein the rear wall 13b has at least one bonding piece 211 around the pass through hole 131 in the rotor 13 projected in a length direction of the washing shaft 4 for enhancing bonding force between the connector 16 of resin and the rotor 13 at the time of insert molding of the connector.
- [11] A direct drive motor in a washing machine comprising:
a stator 14 having a winding portion with coils wound thereon;
a rotor 13 fixedly connected to a washing shaft 4 for direct drive of a drum, the rotor 13 having a sidewall 13b, and a rear wall 13a formed as one body by pressing steel plate, with a pass through hole 131 at a center of the rear wall 13a;
and
a connector 16 of resin insert molded such that the connector 16 is bonded on inner, and outer sides of the rear wall 13a of the rotor including communication holes 137 therein to form one body with the rotor, and fixedly connected to the washing shaft to connect the rotor to the washing shaft, and support the washing shaft.
- [12] The direct drive motor as claimed in claim 11, wherein the washing shaft 4 is formed of metal, and the connector 16 is formed of resin which insulates between the washing shaft 4 and the rotor 4
- [13] The direct drive motor as claimed in claim 12, wherein the connector 16 includes a serration 164 on an inside circumferential surface having a shape in conformity with a shape of a serration 400 at a rear end portion of the washing shaft 4.
- [14] The direct drive motor as claimed in claim 6, wherein the connector 16 further includes reinforcing ribs 161 for reinforcing strength of the connector 16.
- [15] The direct drive motor as claimed in claim 11, wherein the rotor 13 includes at least one communication hole in a neighborhood of the pass through hole 131 for enhancing bonding force between the connector 16 of resin and the rotor at the time of insert molding of the connector.
- [16] The direct drive motor as claimed in claim 11, wherein the pass through hole 131 in the rotor 13 has a bonding piece 210 projected in a length direction of the washing shaft 4 for enhancing bonding force between the connector 16 of resin and the rotor 13 at the time of insert molding of the connector.

- [17] The direct drive motor as claimed in claim 11, wherein the rear wall 13b has at least one bonding piece 211 around the pass through hole 131 in the rotor 13 projected in a length direction of the washing shaft 4 for enhancing bonding force between the connector 16 of resin and the rotor 13 at the time of insert molding of the connector.
- [18] A direct drive motor in a washing machine comprising:
a stator 14 having a winding portion with coils wound thereon;
a rotor 13 of magnetic metal fixedly connected to a washing shaft 4 of metal for direct drive of a drum, the rotor 13 having a sidewall 13b, and a rear wall 13a with a pass through hole 131 at a center; and
a connector 16 of resin for insulating between the washing shaft and the rotor, insert molded at the center of the rear wall 13a of the rotor 16 to form one body with the rotor, and connect the washing shaft to the rotor.
- [19] The direct drive motor as claimed in claim 18, wherein the rotor 13 includes at least one communication hole in a neighborhood of the pass through hole 131 for enhancing bonding force between the connector 16 of resin and the rotor at the time of insert molding of the connector.
- [20] The direct drive motor as claimed in claim 19, wherein the connector 16 is insert molded in the rotor such that the connector 16 covers an inside of the pass through hole 131 and front and rear surfaces of neighborhood of the pass through hole 131 of the rotor.